THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 11

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PAUL M. MILESKI, PATRICK E. GILLES
and BRIAN L. PEASE

Appeal No. 96-1637
Application 08/130,940[1]

ON BRIEF

Before URYNOWICZ, BARRETT and FLEMING, Administrative Patent Judges.

URYNOWICZ, Administrative Patent Judge.

DECISION ON APPEAL

This appeal is from the final rejection of claims 1-14, all the claims pending in the application.

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[1] Application for patent filed October 4, 1993.

The invention pertains to an antenna. Claim 1 is illustrative and reads as follows:

1. A system for receiving and transmitting radio signals in high latitude regions where the environment includes sea ice, said system comprising:

an antenna for transmitting and receiving substantially vertically polarized radio waves, said antenna being formed from a wire; and

said antenna being deployed on and extending along an upper surface of said sea ice.

The references relied upon by the examiner as evidence of obviousness are:

Rogers et al. (Rogers)	1,322,622	Nov. 25, 1919
Hine (British Patent Document)	GB 2 140 215A	Nov. 21, 1984

Claim 12 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which appellants regard as their invention.

Claims 1-14 stand rejected under 35 U.S.C. § 103 as being unpatentable over Hine taken alone or in combination with Rogers.

The respective positions of the examiner and the appellants with regard to the propriety of these rejections are set forth in the final rejection (Paper No. 4) and the examiner's answer (Paper No. 10) and the appellants' brief (Paper No. 9).

Appellants' Invention

In Figure 1 appellants disclose an antenna system having a wire 12 which extends along a surface 14 of sea ice 10. Wire 12 is connected at one end to a means 16 for receiving and/or transmitting radio wave signals. At its opposite end, the wire 12 is connected to the seawater 21 by means of an end portion 23 which passes through a hole 22 in the ice. The receiving and transmitting means 16 comprise a tuner 18 and a transceiver 20. In Figure 2, the tuner is disclosed as a series of 600 pF capacitors 62, 64 and 66. The tuner is preferably grounded by wire 24 which passes through a second hole 26 in the sea ice 10 into seawater 21. The antenna transmits and receives vertically polarized radio or electromagnetic waves which are closely coupled to the surface of the sea ice.

Figure 3A illustrates a second embodiment comprising a dipole antenna 34 formed by two wires 36 and 38 extending along the surface 14 of the sea ice 10 in opposite directions.

Figure 4 illustrates an antenna formed by a single ungrounded wire 40. The wire is attached at one end to tuner 18 which is grounded to seawater by a wire 44 passing through a hole 42 in the sea ice. The second end of the wire 40 is connected to a reel 45 for winding and unwinding the antenna wire.

Figure 5 illustrates yet another embodiment wherein a series inductor 46 is used to reduce the physical length of wire 40 needed to have an effective antenna. The inductor 46 is connected between the tuner 18 and an end of the wire 40.

The Prior Art

Hine discloses an antenna of metal elements buried in the earth or located in the sea. The natural conductivity of the wet earth and sea is used to carry low and extra low frequency signals to and from the antenna.

Rogers discloses an antenna comprising wires laid directly on, or buried in, the earth and parallel to the surface thereof. In Figure 8, Rogers illustrates the antenna supported on the surface of water. The reference indicates that signals can be sent and received by the antenna with great facility.

The Rejection of claim 12

under 35 U.S.C. § 112, Second Paragraph

It is the examiner's position that the language in the preamble of claim 12 "for use in a sea ice environment on a surface of said ice" is indefinite because it does not set out a system disposed on a sea ice surface.

We will not sustain this rejection. It is apparent from language within the body of claim 12 that the invention is disposed

on a sea ice surface. That language requires a grounded antenna wire deployed upon, extending along and in contact with the sea ice surface.

The Rejection of claims 1-14

under 35 U.S.C. §103 over Hine

After consideration of the positions and arguments presented by both the examiner and the appellants, we have concluded that this rejection should not be sustained. We agree in general with the comments made by appellants in their brief.

Common to independent claims 1 and 12-14, the only independent claims, is the requirement that one or more antenna

wires are deployed along the surface of sea ice. Hine teaches antenna wires buried in the earth or located in the sea to take advantage of the "almost perfect conductivity and extremely low impedance" of these environments. Hine does not teach that one or more antenna wires are deployed on a surface, let alone on a surface of sea ice. It has not been explained why one of ordinary skill in the art would have found it obvious to modify Hine to deploy his antenna wires on a surface such as the sea ice surface of the claims. In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783-1784 (Fed. Cir. 1992).

The Rejection of Claims 1-14 under 35 U.S.C. § 103
as Obvious over Hine and Rogers

We will sustain the rejection of claims 1, 2, 7, 10, 11, 13 and 14 as obvious over Hine and Rogers but will not sustain the rejection of claims 3-6, 8, 9, and 12 as obvious over the prior art. With respect to the two arguments made by appellants with respect to claim 1, the antenna of Rogers, like appellants' device, is a wire antenna. There is no rebuttal of the examiner's

reasoning that "the waves radiated by the system of Rogers et al are vertically polarized since long 'waves' (commonly used in Naval communications to communicate around the world, particularly with submarines) are propagated between the antenna element and the ionosphere". The position that Rogers' antenna is for transmitting and receiving substantially vertically polarized radio waves is reasonable in view of the close similarity of the structure of Rogers' and appellants' wire antennas. Furthermore, the examiner's position is supported by the text McGraw-Hill Encyclopedia of Science and Technology, vol. 1, **ANTENNA (ELECTROMAGNETISM) Polarization**, New York, 1971, at pages 483 and 484. In Figures 3 and 4, it is disclosed that the radiation field is in a plane orthogonal to an oscillating electron and an oscillating doublet in an antenna wire.

Such being the case, the horizontal antenna of Figure 8 of Rogers would produce substantially vertically polarized radio waves.

We are not persuaded by the other argument made by appellants that there is nothing in Rogers to suggest deploying an antenna wire on and along an upper surface of a sea ice

environment.

In Figure 8, Rogers illustrates an antenna wire on and along an upper surface of a sea environment. Whereas sea ice is only sea water reduced to the solid state, it is considered that Rogers would have suggested to one of ordinary skill in the art the use of Rogers' antenna on the surface of sea ice.

Regarding claim 2, appellants' argument that Rogers does not teach a tuner is not well taken. Elements such as capacitors 13 and 14 comprise a tuner. Clearly, each of Rogers' communication stations needs a tuner to receive incoming signals at receiver 12.

With respect to dependent claim 7 and independent claim 14, Rogers discloses at column 3, lines 1-11, that antenna wire 16 is preferably in contact with the earth and constitutes a ground connection along its entire length. Thus, in using the term "preferably", Rogers suggests another arrangement, that not preferred, where the antenna wire would be ungrounded. As to claims 10, 11 and 13, Rogers shows in Figures 2 and 3 an antenna formed from first and second wires extending in opposite directions.

As to dependent claim 3, the examiner's position that it

would have been obvious to pass the second end of an antenna wire through a hole in the sea ice so as to make contact with the sea water beneath the ice is not persuasive. There is no evidence in support of this position. The examiner's opinion is based on unsupported conclusions that water has better conductivity than sea ice, that it is widely known, particularly in naval communications, that sea water acts as a waveguide for ELF signals, and that such knowledge is analogous to burying ground radials in the earth for a vertical (Marconi type) radiator used by amateur radio operators since the 1920's (Answer, page 7). Assertions of technical facts in areas of esoteric technology must always be supported by citation to some reference work recognized as standard in the pertinent art. In re Ahlert, 424 F.2d 1088, 165 USPQ 418 (CCPA 1970). Such being the case, the judgment of obviousness takes into account knowledge which has not been shown to be within the level of ordinary skill in the art at the time the invention was made. Thus, it appears that the examiner's hindsight reconstruction is improper. In re McLaughlin, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Concerning claims 4-6, 8, 9, and 12, the rejection of these claims will not be sustained essentially for the same reason that the rejection of claim 3 will not be sustained. There is no prior art evidence teaching the passing wire through a hole in sea ice. Still further, these claims define over the prior art by reciting that the wire is a ground wire.

Summary

In summary:

a) the decision of the examiner to reject claim 12 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which appellants regard as their invention is reversed.

b) the decision of the examiner to reject claims 1-14 under 35 U.S.C. § 103 as being unpatentable over Hine is reversed.

c) the decision of the examiner to reject claims 1-14 under 35 U.S.C. § 103 as being unpatentable over Hine and Rogers is affirmed as to claims 1, 2, 7, 10, 11, 13 and 14, and is reversed as to claims 3-6, 8, 9 and 12.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

STANLEY M. URYNOWICZ, JR. Administrative Patent Judge	)	
LEE E. BARRETT Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
MICHAEL R. FLEMING Administrative Patent Judge	)	

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